

AIM JORACO®

"The Pneumatic Toggle Press Innovators."® Since 1947



AUTOMATED INDUSTRIAL MACHINE, INC

TOGGLE-AIRE® DIVISION

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Installation, Operation and Maintenance
Hydro-Pneumatic Series Bench Presses

HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

IMPORTANT

It is the responsibility of the employer/purchaser to provide his or her employees with proper point of operation guards, and to ensure that this equipment is used in accordance with the manufacturer's recommendations as well as any OSHA, federal, or state regulations that are applicable to such equipment. Because it is impossible to anticipate the conditions under which our equipment will be operated, additional safety devices and methods may be required to ensure operator safety. Besides conforming to all federal, state, and local codes, the buyer should consider the safety of the entire operation involving any press, and see that any additional guarding, training, and maintenance deemed necessary is developed and enforced to protect the wellbeing of the operator.

THINK SAFETY . . .

. . . WORK SAFELY

HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

Index

Section I - Press Overview

- 1.1 - Description
- 1.2 - Features
- 1.3 - Options
- 1.4 - Cylinder Components
- 1.5 - Function

Section II - Valving

- 2.1 - Pneumatic Circuit
- 2.2 - Valving Connections

Section III - Installation

- 3.1 - Un-boxing
- 3.2 - Synchro-Sig Installation
- 3.3 - Mounting Press
- 3.4 - Connect Air Supply
- 3.5 - Turn On Air Supply
- 3.6 - Test the Installation

Section IV - Set-Up and Operation

- 4.1 - Mounting Tooling
- 4.2 - Stroke Limitation

7.5 Force

Section V - Venting, Purging, Filling

- 5.1 - Vent / Fill
- 5.2 - Purge / fill

Section VI - Troubleshooting

- 6.1 - Ram Will Not Extend
- 6.2 - Ram Will Not Retract
- 6.3 - Cylinder Will Not Switch to Power Stroke Cycle
- 6.4 - Frequent Oil Fills
- 6.5 - Press Not Generating Pressure
- 6.5 - Ram Will Not Fully Retract

Section VII - Engineering Data

- 7.1 Standard Specifications
- 7.2 Cylinder Mounting
- 7.3 Bolster Plate Mounting
- 7.4 Cycle Times Charts

Section VIII - Replacement Parts

- 8.1 Replacement Parts List

HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

Section I: Press Overview

1.1 Description

The Hydro-Pneumatic (HP) Series Press is a completely self-contained, air-over-oil unit that is cost-effective and can be used in a variety of assembly and forming applications including punching, marking, staking, cutting, crimping and flaring. Our HP presses are available in sizes from 2 to 16 tons and the standard specifications are: 4" stroke with up to ½" power stroke, 8" open height, 20" between columns and an 8" x 10" precision ground bolster plate. Our HP Series Presses cut down on air consumption but still deliver the maximum force required for your application.

1.2 Features

- Self-contained
- Clean
- Quiet
- Adaptable
- No springs
- Only 3 moving components
- No external hydraulics

1.3 Options

- EZ-Dial Force Regulator
- Adjustable Output
- Filter, Regulator, Lubricator (FRL) - clean room compliance
- Dwell Timer
- Non-Rotating Ram
- Can be PLC ready for automated setups and force monitoring packages

***** Custom Features may be quoted upon request**

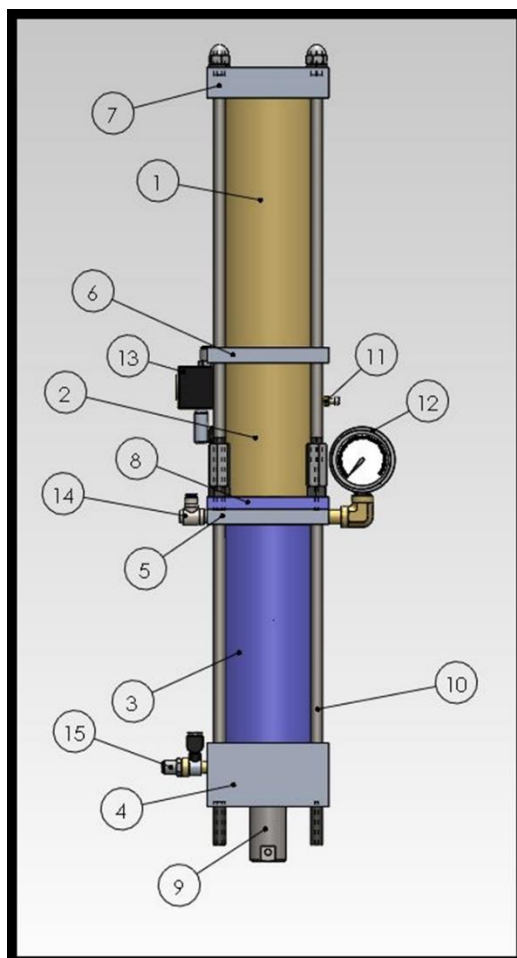
***** C-Frame option also available upon request**

***** HP Series Cylinders also sold separately**

HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

1.4 Cylinder Components



Item No.	Description
1	High Pressure Advance
2	Rapid Advance
3	High Pressure Intensifier
4	High Pressure Cylinder Head
5	High Pressure Intermediate Cylinder Head
6	Low Pressure Intermediate Cylinder Head
7	Low Pressure Cylinder Head
8	Tie Rod Plate
9	Ram
10	Tie Rod
11	Venting Plug
12	Pressure Gauge
13	4 Way Valve
14	Bleed / Fill Valve
15	HP Sensor

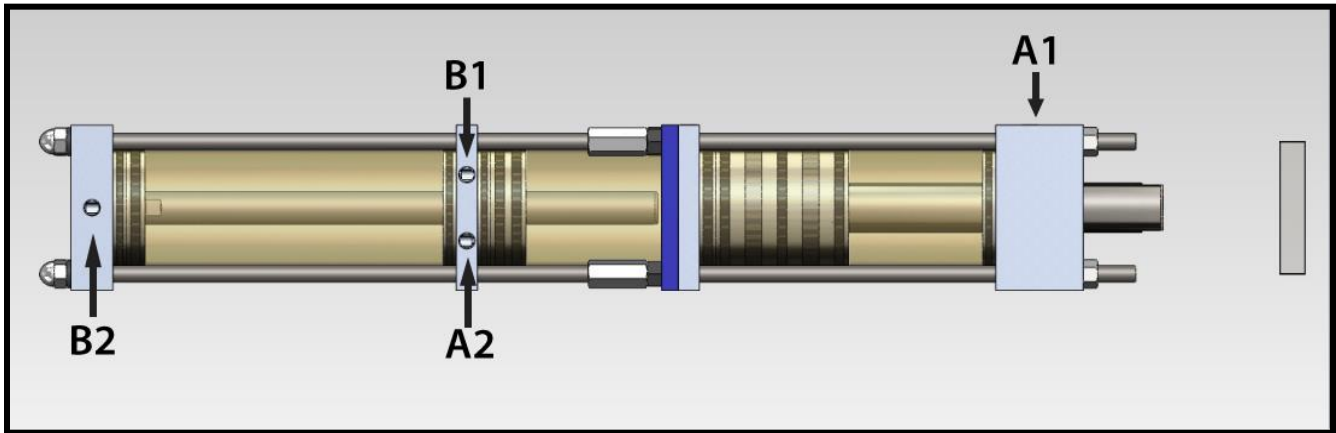
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OVERVIEW, INSTALLATION, AND OPERATION

1.5 Function

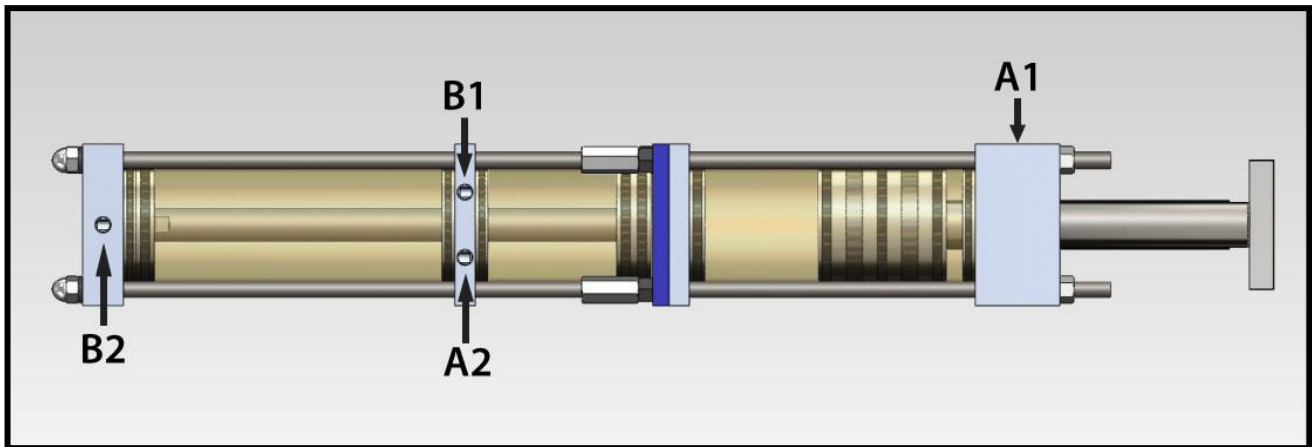
Cylinder Retracted

For the cylinder to retract, compressed air is supplied to ports A1 and A2, fully retracting the high pressure, rapid advance and intensifier pistons.



Rapid Advance

For the cylinder to begin rapid advance, compressed air is supplied to port B1. This forces the rapid advance piston down towards the working end of the cylinder, forcing oil from the reservoir to the top of the intensifier piston until resistance is met.

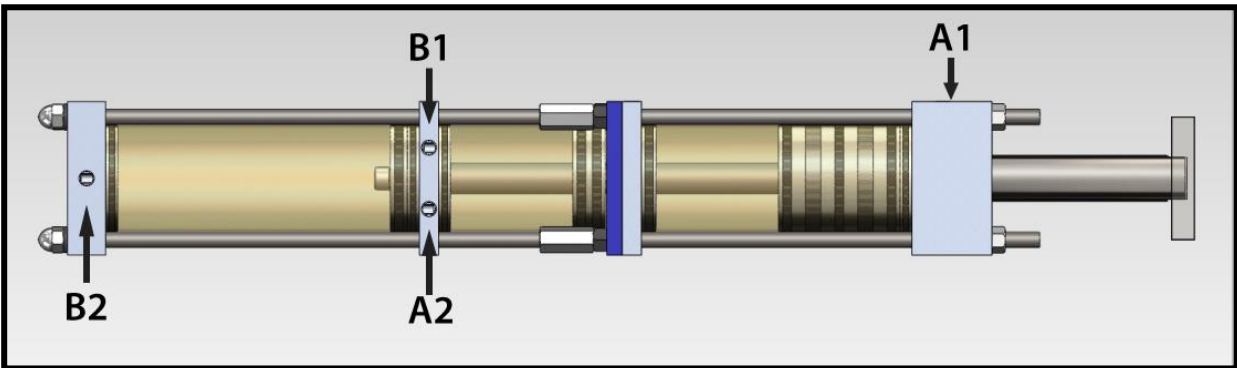


HYDRO-PNEUMATIC SERIES PRESSES

OVERVIEW, INSTALLATION, AND OPERATION

Power Stroke

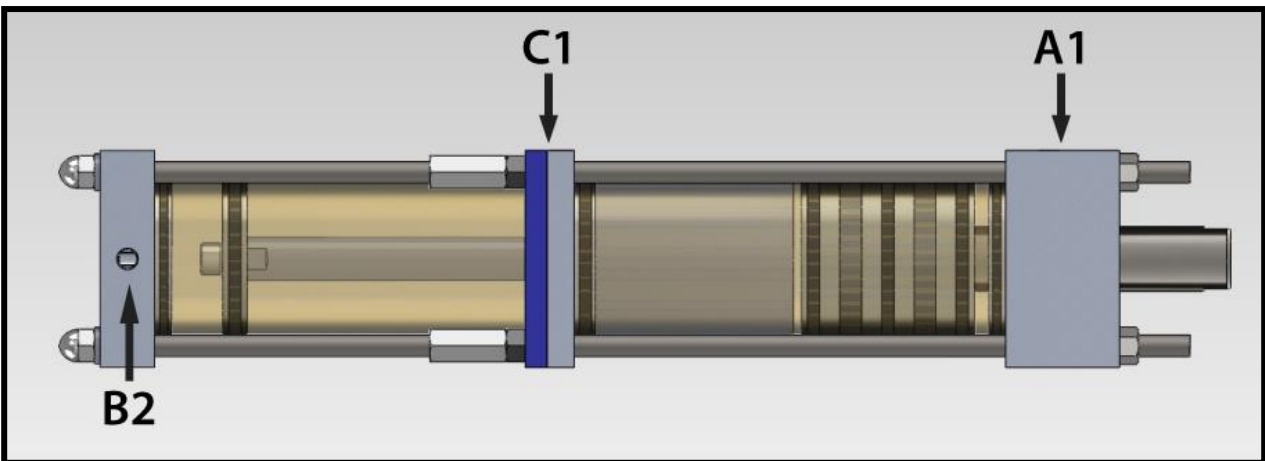
For the cylinder to begin the power stroke, compressed air is supplied to port B2. This forces the high-pressure piston and rod down towards the working end of the cylinder. The high-pressure piston and rod travel until reaching the high-pressure seal, which will be the point at which pressure begins to build. As the rod and piston continue traveling, oil that was displaced during the rapid advance is compressed and builds pressure. Once the work has been completed the cylinder will then retract as mentioned above.



Power Stroke Only Option

HP Series Presses are also sold as power stroke only. This will simply eliminate the rapid advance section and shorten the total travel of the cylinder.

For the cylinder to begin the power stroke, compressed air is supplied to port B2. This forces the high-pressure piston and rod down towards the working end of the cylinder. In the power stroke only configuration the high-pressure piston and rod are always in contact with the high-pressure seal. This means that as soon as compressed air is supplied to port B2 the cylinder will begin building pressure. As the high-pressure piston and rod continue traveling the oil is compressed and builds pressure. The cylinder will retract when compressed air is supplied to ports A1 and C1.

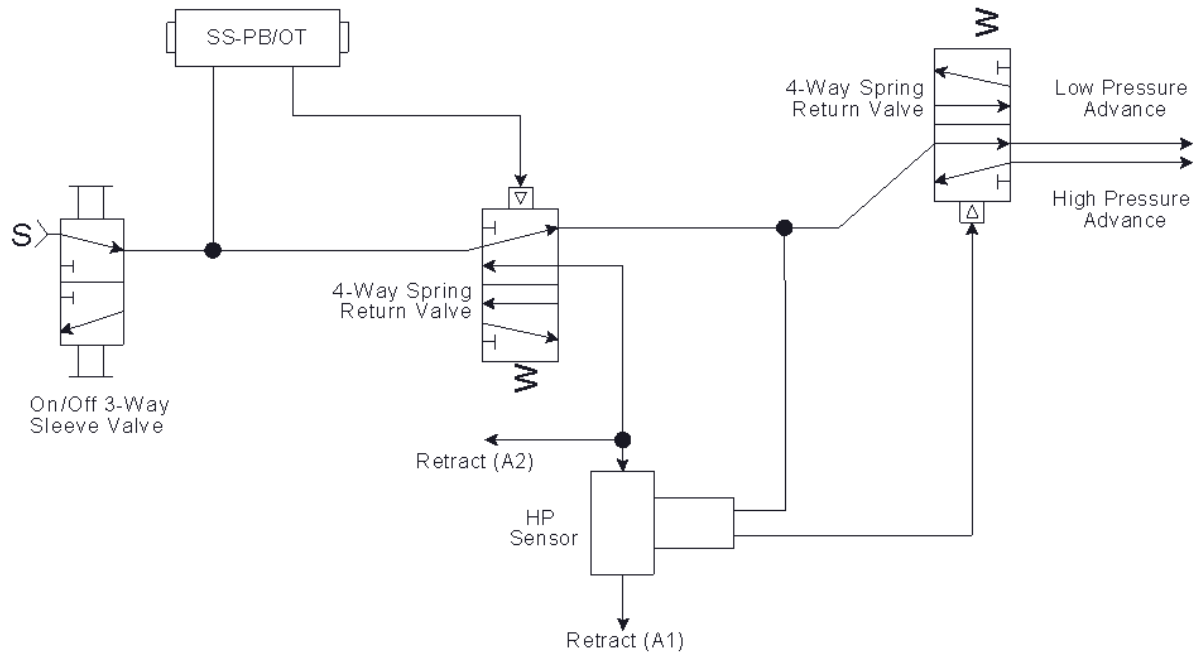


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INSTALLATION, OPERATION, AND MAINTENANCE

Section II: Valving

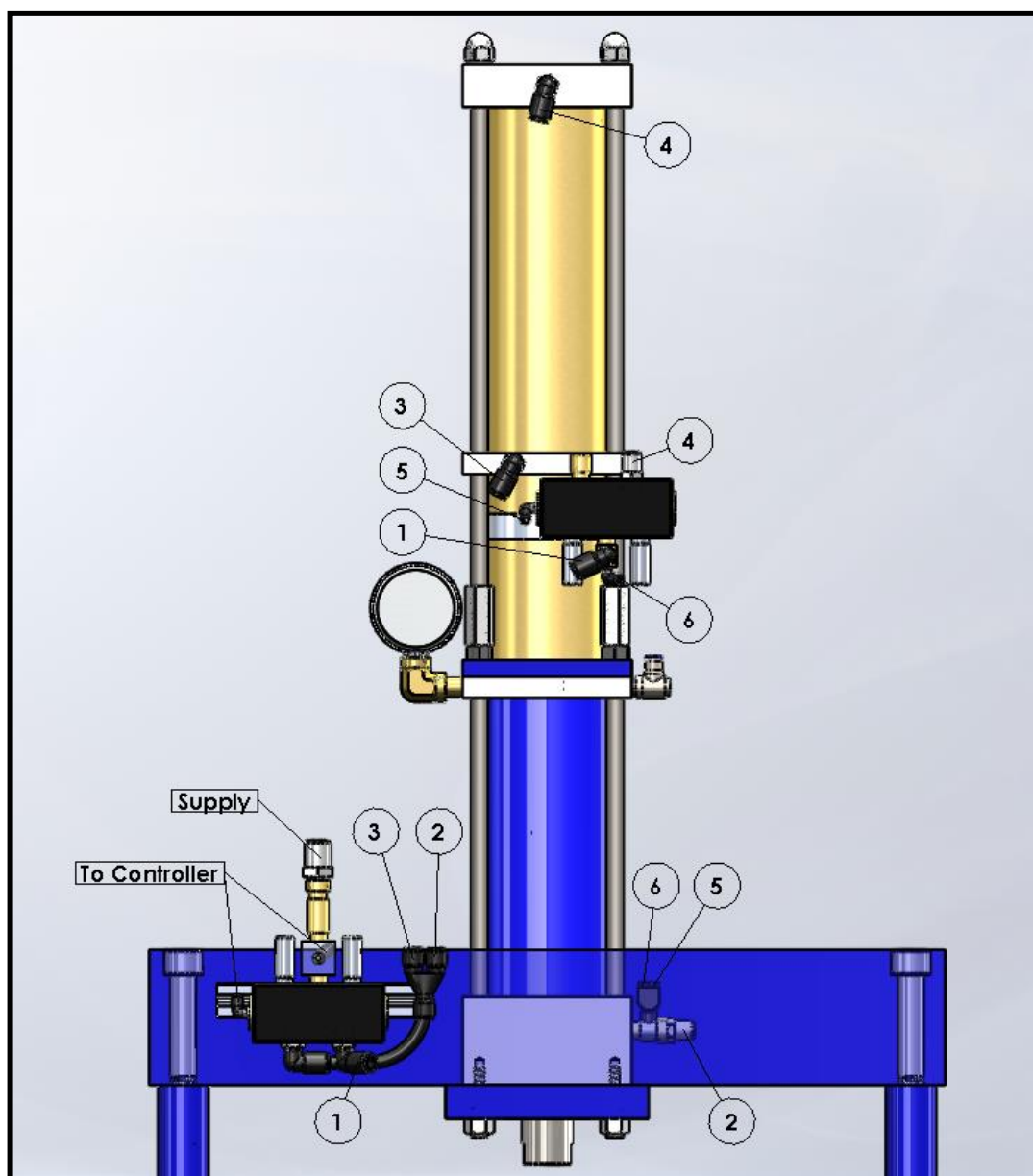
2.1 Pneumatic Circuit



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INSTALLATION, OPERATION, AND MAINTENANCE

2.2 Valving Connections



Valving Connections	Valving Description
1-1	Rapid Advance
2-2	Low Pressure Retract
3-3	High Pressure Retract
4-4	High Pressure Advance
5-5	High Pressure Signal (S)
6-6	High Pressure Power (P)

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INSTALLATION, OPERATION, AND MAINTENANCE

Section III: Installation

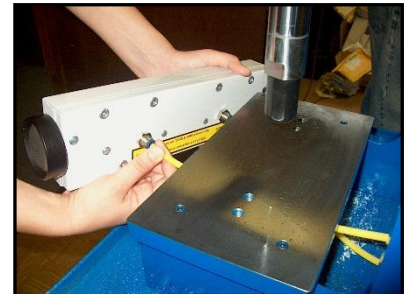
3.1 Un-boxing

Carefully remove the press from the crate, taking note of separately packed items such as the "Quick Exhaust Unit"(Optional), FRL Unit (Optional) and "Synchro-Sig" Actuator.

Synchro-Sig may come mounted on some models

3.2 Synchro-Sig Installation

- A. Locate the 1/4" yellow tubing found under the press platen. Connect the tubing to the appropriate fittings on the actuator. See markings on the tubing. **DO NOT OVERTIGHTEN** normally, 1/2 turn past finger tight is sufficient for an airtight connection. (Figure 1.1)
- B. Using the 1/4-20 hex head bolts supplied, mount the "Synchro-Sig" to the press as shown. Be sure to mount the aluminum lever guard between the actuator and the press at the same time. (Figure 1.2)



NOTE: To ensure operator safety some applications may require that you locate the "Synchro-Sig" actuator further away from your tooling.

- PICTURES ARE FOR REFERENCE ONLY-
SOME SECTIONS OF THIS MANUAL MAY NOT APPLY TO YOUR PRESS UNIT.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

3.3 Mounting Press

- A. Select a bench of suitable size and strength.
- B. Bolt the press to the bench using the holes located in the press frame below the platen area. Never operate the press unless it is securely mounted on a bench or stand. (Figure 1.3)

CAUTION: WHENEVER CONNECTING YOUR AIR SUPPLY TO THE PRESS BE CERTAIN TO FOLLOW SAFE OPERATING PROCEDURES AND KEEP ALL PARTS OF YOUR BODY AWAY FROM THE MOVING PARTS OF THE PRESS!



(Figure 1.3)

3.4 Connect Air Supply

- A. The air supply must be clean and conditioned. Preferably, a Filter, Regulator, Lubricator Unit, (Joraco Part No. FRL-HP) should be located within 6 feet of the press. For optimum results all air lines, fittings, and hoses used to supply the press should be the equivalent of **1/2" minimum**.
- B. The minimum air pressure for operation is 50 PSI; the maximum is 100 PSI. The optimum operating range is 60-100 PSI. If your application consistently required substantially more than 100 PSI it may indicate the need for a stronger press.
- C. Connect air supply to the press at the inlet port.



(FRL Unit)

NOTE: If lower air pressure is required consult factory about EZ-Dial option

NOTE: A three way Shut Off Valve like the one supplied must always be used to ensure complete bleeding of the press circuits when air supply is off.



(Inlet)

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

3.5 Turn On Air Supply

- A. Remove the yellow lock out device found on the On-Off Valve. To turn the air on simply move the gold colored sleeve downward until it stops. Slide the sleeve upward to the stop to shut the supply off. With the supply on, check for air leaks and be sure all connections you have made are secure and airtight. If air leaks from inside the "Synchro-Sig" actuator the connections are incorrect. Correctly reconnect the tubing, taking note of the tubing labels.

CAUTION: ENSURE HANDS ARE CLEAR OF ANY TOOLING BEFORE TURNING OFF AIR SUPPLY. THE WEIGHT OF A HEAVY TOOL MAY CAUSE IT TO DROP UNEXPECTEDLY. IF HEAVY TOOLING IS BEING USED BE SURE TO PLACE A STOP UNDER TOOLING BEFORE TURNING OFF AIR SUPPLY

NOTE: When the press is not in use or being serviced or maintained, always **SHUT OFF** the air supply and replace the lockout device. Secure with a padlock, etc. to prevent unauthorized use of the press.

CAUTION: BEFORE PROCEEDING, MAKE SURE THE TABLE AND WORK AREA IS CLEAR OF ALL TOOLS, FOREIGN OBJECTS, AND BODY PARTS.

3.6 Test The Installation

- A. Test the "Synchro-Sig" Two Hand Actuator by simultaneously depressing the levers on the Model SS-PB or by simultaneously placing a finger in each sensing "button" on the Model SS-OT. The press should cycle once, return to the top of the stroke, and await another signal from the actuator. If the levers or "buttons" are continuously held down the press should remain in the down position until one or both levers or buttons are released.



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section IV: Set Up and Operation

NOTE: Prior to installing any tooling in the press, proper point of operation guarding, specifically designed for your tooling, must be built and mounted on or around your tooling.

CAUTION: NEVER OPERATE, SERVICE OR ADJUST THIS MACHINE WITHOUT PROPER INSTRUCTION.

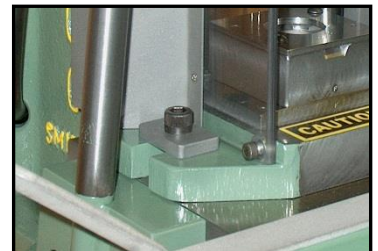
NEVER SERVICE THIS MACHINE WITHOUT FIRST SHUTTING OFF AIR SUPPLY.

NEVER OPERATE THIS MACHINE WITH SAFETY GUARDS REMOVED.



4.1 Mount your tooling

- A. Using the tapped holes in the press platen, mount the lower portion of your tooling to the press. The platen is machinable and can be drilled and tapped as necessary. The standard bore in the press ram is .8125" with a depth of 1.5". Precisely fit your shank to the bore of the ram and lock the shank in with the 5/16-18 hardened lock screw located on the face of the ram. The end of the ram should bear against the upper portion of your tooling.



NOTE: If your tool incorporates guide pins etc., be sure the tooling easily moves along the full length of travel with no binding or misalignment. Correct any problems found in the tool before placing tooling into production.

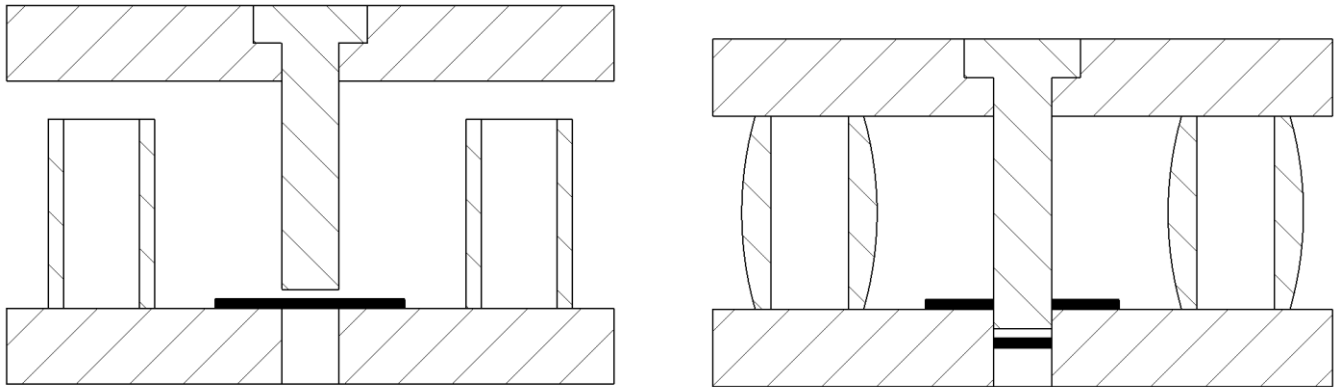


HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

4.2 Stroke Limitation

For punching and piercing applications, the travel of the cylinder must be limited after completing the work required. This limitation can be built into the tooling that is being used for the application, with the use of die springs. Failure to limit the travel of the cylinder in these types of applications may cause damage and premature failure of the cylinder.



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section V: Venting / Filling

These procedures are not required for new machine set up and operation. AIM Joraco supplies machines ready for operation which are filled with oil and purged of air. Only perform these procedures as needed during troubleshooting process (see Section VI).

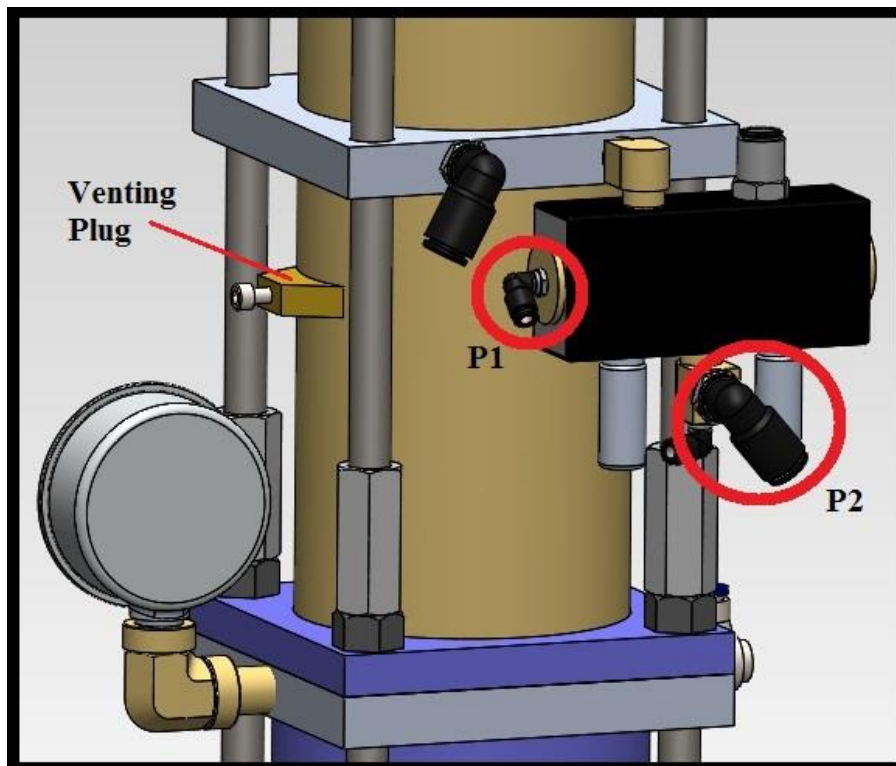
DO NOT DEVIATE FROM THE FOLLOWING PROCEDURES. DOING SO COULD RESULT IN OVERFILLING OF THE CYLINDER, WHICH COULD CAUSE DAMAGE/MALFUNCTION.

IT IS RECOMENDED TO WEAR EYE PROTECTION WHEN PERFORMING THE FOLLOWING PROCEDURES.

Items Required

- Hydraulic Oil - HF-101 ISO-VG 32
- AIM Joraco Oil Pump - HP-100F
- Flathead screwdriver
- 7/16" wrench
- Shimming material
- Catch can
- Eye protection (recommended)

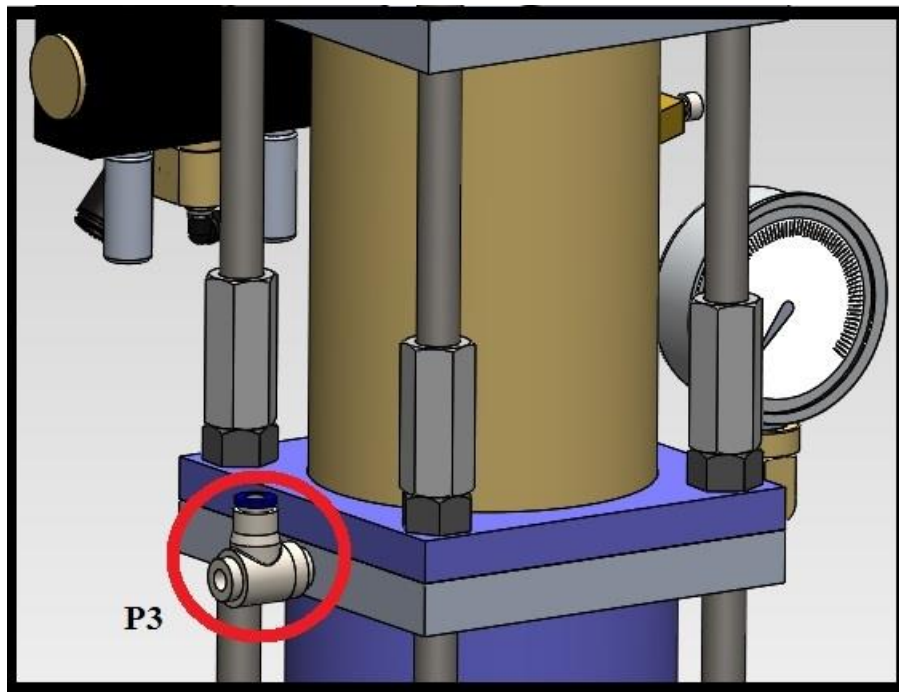
Figure 1



HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Figure 2



5.1 Air Venting/Adding Oil Procedure

To remove any air pockets from hydraulic cylinder, perform the following procedure.

1. With air still supplied to the cylinder make sure the ram is in the home position (cylinder retracted)
2. Place shims between the bolster plate and the ram. It is important to get the shims as tight as possible to ensure the correct amount of oil will be added to the cylinder.
3. Dump the air to the cylinder by releasing the sleeve valve
4. Open venting plug screw
See Figure 1
5. Make sure that AIM Joraco Oil Pump - HP-100F is filled with oil (30 fl oz min) and vented completely of any air (no air bubbles in the hose)

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.1 Air Venting/Adding Oil Procedure (continued)

6. Attach ¼" Poly-flow line from AIM Joraco Oil Pump HP-100F to the bleed valve (P3)
See Figure 2
7. Turn screw on bleed valve (P3) counterclockwise until it stops (valve open)
8. Begin pumping oil from AIM Joraco Oil Pump - HP-100F (some force may be required)
9. Continue pumping oil until it begins to flow out of the vent hole and is free of any air bubbles
10. Wait 30 minutes to allow any remaining bubbles in the oil to escape, then repeat step 8
11. Turn screw on bleed valve (P3) clockwise until it stops (valve closed)
12. Wipe any excess oil from the cylinder tube making sure the area around the vent hole is clean and dry
13. Replace venting plug screw and hand tighten lightly
14. Remove AIM Joraco Oil Pump - HP-100F from bleed valve (P3)
15. Cylinder is ready for operation

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.2 Replacing Oil

Do not perform Replacing Oil procedure unless recommended by an AIM Joraco technician.

To fully purge and replace oil in hydraulic cylinder, perform the following procedure.

1. With air still supplied to the cylinder make sure the ram is in the home position (cylinder retracted)
2. Place shims between the bolster plate and the ram. It is important to get the shims as tight as possible to ensure the correct amount of oil will be added to the cylinder.
3. Dump the air to the cylinder by releasing the sleeve valve
4. Open venting plug screw
See Figure 1
5. Disconnect hose from port (P1) on 4-way valve
See Figure 1
6. Disconnect hose from port (P2) on 4-way valve
See Figure 1
7. Attach ¼” Poly-flow line to bleed valve (P3)
See Figure 2
8. Route ¼” Poly-flow line to catch pan to retain oil being removed from cylinder
9. Turn screw on bleed valve (P3) counterclockwise until it stops (valve open)
10. Supply air to port (P2) to begin forcing the oil out of the cylinder
11. Continue supplying air to port (P2) until oil stops flowing from ¼” Poly-flow line
12. Turn screw on bleed valve (P3) clockwise until it stops (valve closed)

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

5.2 Replacing Oil (continued)

13. Remove ¼” Poly-flow line from bleed valve (P3)
14. Make sure that AIM Joraco Oil Pump - HP-100F is filled with oil (30 fl oz min) and vented completely of any air (no air bubbles in the hose)
15. Attach ¼” Poly-flow line from AIM Joraco Oil Pump HP-100F to the bleed valve (P3)
16. Turn screw on bleed valve (P3) counterclockwise until it stops (valve open)
16. Begin pumping oil from AIM Joraco Oil Pump - HP-100F (some force may be required)
17. Continue pumping oil until it begins to flow out of the vent hole and is free of any air bubbles.
18. Wait 30 minutes to let any remaining bubbles in the oil to escape, then repeat step 8
19. Turn screw on bleed valve (P3) clockwise until it stops (valve closed)
20. Wipe any excess oil from the cylinder tube making sure the area around the vent hole is clean and dry.
21. Replace venting plug screw and hand tighten lightly
22. Remove AIM Joraco Oil Pump - HP-100F from bleed valve (P3)
23. Replace lines to ports (P1) and (P2)
24. Cylinder is ready for operation.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section VI: Troubleshooting

6.1 Ram Will Not Extend

Cause	Solution
Air is not on	Turn on air supply
Insufficient air supply	Increase air supply pressure
Defective valve	Contact AIM Joraco to replace
Tooling is binding	Inspect / repair tooling

6.2 Ram Will Not Retract (stuck in down position)

Cause	Solution
Insufficient air supply	Increase air supply pressure
Defective valve	Contact AIM Joraco to replace
Tooling is binding	Inspect / repair tooling

6.3 Cylinder Will Not Switch to Power Stroke Cycle

Cause	Solution
Air lines routed incorrectly	Refer to section 2.1
Defective valve	Contact AIM Joraco to replace
Defective HP sensor	Contact AIM Joraco to replace
Cylinder low on oil	Refer to section 5.1
Air trapped in oil reservoir	Refer to section 5.1

6.4 Frequent Oil Fills

Cause	Solution
Damaged / worn seals	Send cylinder to AIM Joraco
Defective bleed / fill valve	Contact AIM Joraco to replace

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

6.5 Press Not Generating Pressure

Cause	Solution
Insufficient air supply	Increase air supply pressure
Cylinder low on oil	Refer to section 5.1
Cylinder out of working range	Adjust tooling
Damaged / worn seals	Send cylinder to AIM Joraco

6.6 Ram Does Not Fully Retract

Cause	Solution
Insufficient air supply	Increase air supply pressure
Tooling is binding	Inspect / repair tooling
Air trapped in oil reservoir	Refer to section 5.1

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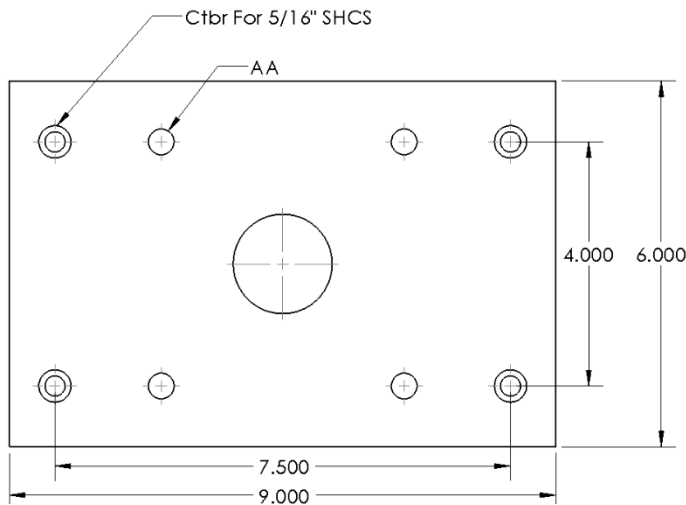
INSTALLATION, OPERATION, AND MAINTENANCE

Section VII: Engineering Data

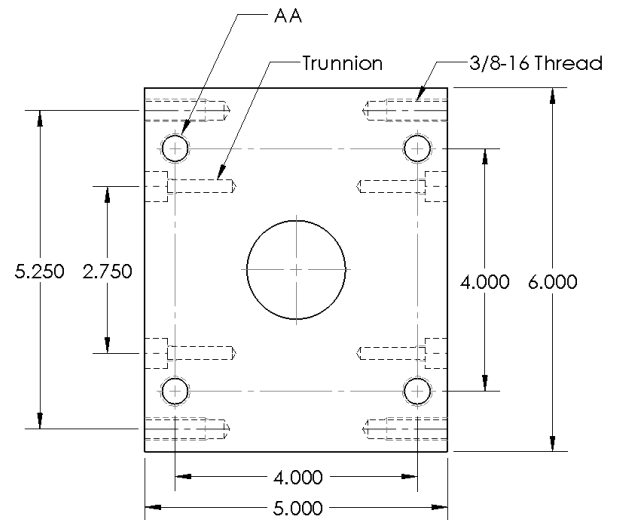
7.1 Standard Specifications

Specifications	HP-4	HP-8	HP-16
Force at 100 PSI	9,700 lbs	17,700 lbs	34,200 lbs
Air Consumption at 80 PSI	0.76 cf.	1.15cf.	1.80cf.
Open height	8.0"		
Total stroke (1/2" Power Stroke)	4.0"		
Working area (H-frame)	20" L-R, 10" F-B		
Ram mounting	13/16" Bore, 1/2" Deep		

7.2 Cylinder Mounting



H-Frame Cylinder Mount



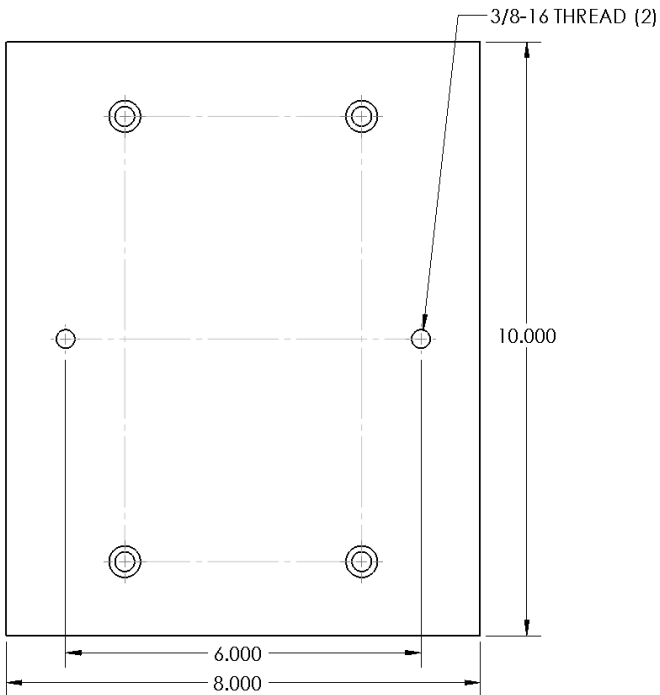
C-Frame Cylinder Mount

Model	AA
HP-4	1/2-13
HP-8	1/2-13
HP-16	3/4-16

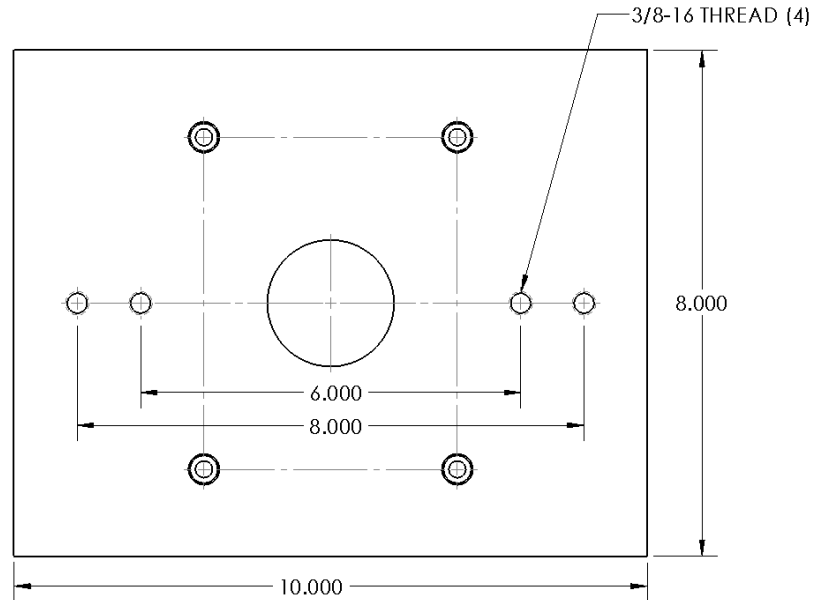
HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

7.3 Bolster Plate Mounting



H-Frame Bolster Plate



C-Frame Bolster Plate

NOTE: CUSTOM MOUNTING HOLES AVAILABLE UPON REQUEST

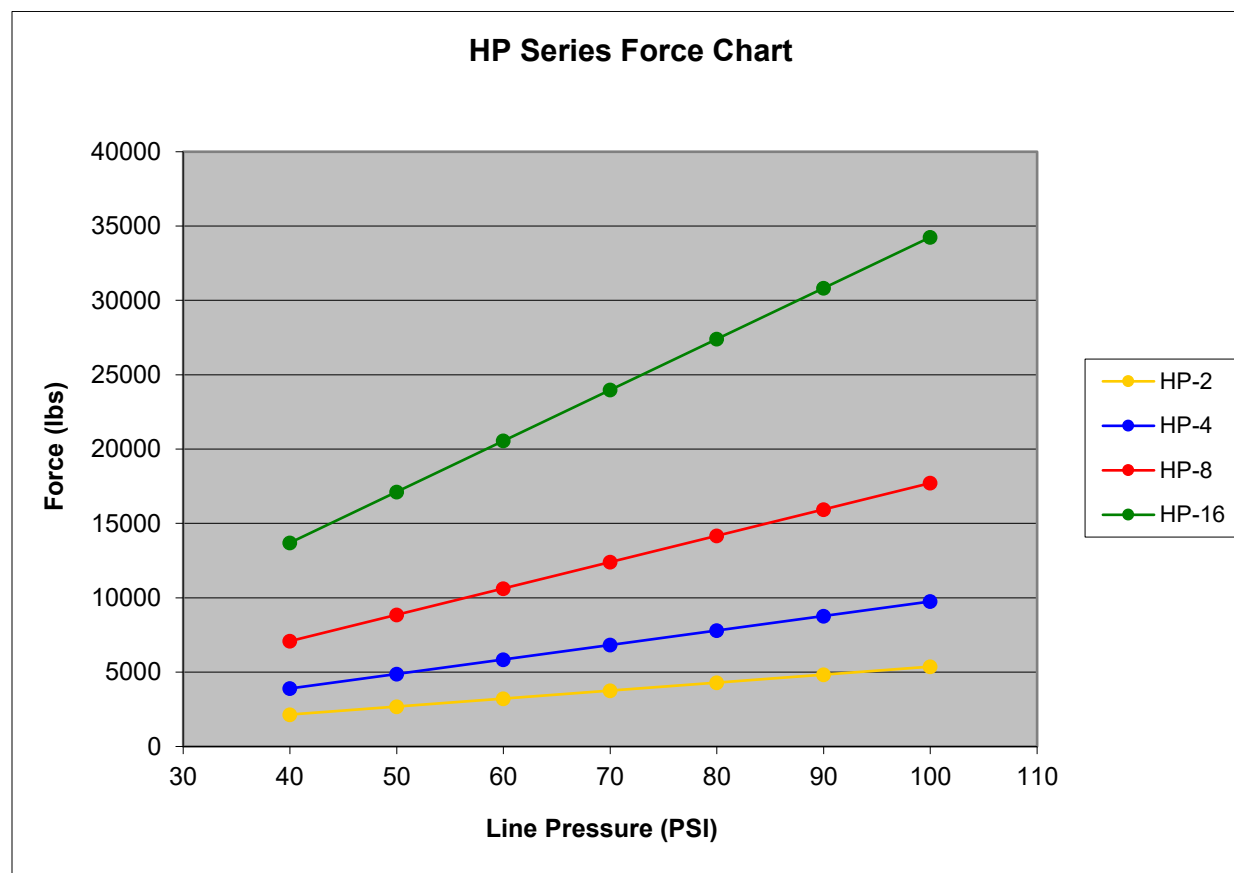
7.4 Cycle Times

Cycle times vary depending on the volume of air supplied to the unit by the customer, the length of the stroke and the weight of tooling applied to the press.

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

7.5 Force Charts



	Force Multiplier	Pressure Multiplier	Approach Force	Retract Force
HP-2	53.69 x line pressure	8.27 x line pressure	5.71 x line pressure	4.73 x line pressure
HP-4	97.53 x line pressure	8.27 x line pressure	11.00 x line pressure	10.00 x line pressure
HP-8	177.16 x line pressure	15.02 x line pressure	11.00 x line pressure	10.00 x line pressure
HP-16	342.54 x line pressure	29.05 x line pressure	11.00 x line pressure	10.00 x line pressure

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Section VIII: Replacement Parts List

8.1 Replacement Parts List

Part #	Description
HP16-CYL	Replacement Cylinder, 16T STANDARD
HP8-CYL	Replacement Cylinder, 8T STANDARD
HP4-CYL	Replacement Cylinder, 4T STANDARD
HP2-CYL	Replacement Cylinder, 2T STANDARD
HP-RAM-E	Ram Height Extension w/ 1" Adjustment and Threaded Screw
SS-PB-18	Push Button-Pneumatic Synchro-Sig Two Hand Actuator, 18"
EZ-DIAL	Easy Dial Pressure Regulator - 270 Sweep
PRS-1000	Pressure Return System
SCM	Speed Control Mufflers
HP-VPKG	HP Valve Package Complete

HYDRO-AIRE SERIES PRESSES

INSTALLATION, OPERATION, AND MAINTENANCE

Factory Support

Our 40-year reputation for providing quality *TOGGLE-AIRE*, *DIRECT-AIRE* & *HYDRO-AIRE* presses that meet a wide range of special requirements and our 60 years of service and support experience are all available to you with one phone call. It's your biggest advantage in dealing directly with our factory. Make use of it. Please call with any and all questions you may have regarding your applications and our equipment.

Please contact our engineering department to discuss any questions you may have about control systems, modifications, and your applications. We are glad to supply our presses built to your specifications should you require other than our standard systems.

AIM JORACO®

"The Pneumatic Toggle Press Innovators." Since 1947.



WARRANTY

A I M (hereafter referred to as the manufacturer) warrants that all TOGGLE-AIRE & Direct-Aire products will be free from defects in material and workmanship for a period of 180 days from the date of shipment to the original purchaser. Any claim made against this LIMITED WARRANTY must be made by contacting the customer service department of the manufacturer. At its option, A I M will repair or replace any product it deems defective under the terms of this warranty. If factory service is required, transportation costs to and from the factory are to be paid by the purchaser. This warranty does not apply to equipment that has been subject to abuse, misapplication, negligence, improper maintenance, alteration, or failure to follow manufacturer's instructions.

A I M's, SOLE OBLIGATION UNDER THIS WARRANTY IS STATED ABOVE. THIS WARRANTY IS IN LIEU OF ALL OTHERS, EXPRESSED OR IMPLIED, AND UNDER NO CIRCUMSTANCES WILL A I M BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF TOGGLE-AIRE PRODUCTS.

THINK SAFETY . . . WORK SAFELY . . .